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10/686,252	10/16/2003	Cheung Hoi Yu	016660-177	7612

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THOMAS, DAVID C

ART UNIT	PAPER NUMBER
1637	

DATE MAILED: 12/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 10/686,252	**Applicant(s)** YU ET AL.	
	Examiner David C. Thomas	**Art Unit** 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *13-34* is/are pending in the application.

4a) Of the above claim(s) *1-12,25 and 26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *13-24 and 27-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 28, 2006 has been entered. Claims 13, 14, 18, 19, 22, 23, and 27 (currently amended), 15-17, 20, 21, 24, 28-31 (original), and 32-34 (newly added) will be examined on the merits. Claims 1-12, 25, and 26 were previously withdrawn.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 13-24 and 27-34 are rejected under 35 U.S.C. 102(b) as being anticipated by Heller et al. (U.S. Patent No. 5,605,662).

Heller teaches a method of performing field-assisted hybridization in the detection of nucleic acid targets from a sample (applications include DNA and RNA hybridization procedures, column 16, lines 43-49), comprising the steps of providing a reaction cell having a layer formed of a dielectric material defining an attachment surface (surface binding sites are provided on oxidized aluminum or SiO_2 surfaces, column 13 line 60 to column 14, line 4), providing a metal electrode in direct contact with said dielectric attachment layer (metal oxide layer is formed directly on electrode as oxidized aluminum layer, column 14, lines 1-2 and Figure 2, parts 12 and 20), attaching nucleic acid capture probes to said dielectric attachment layer (oligonucleotide probes can be attached to oxidized metal surface by use of aminopropyltriethoxy silane (APS) which reacts readily with oxide groups on metal surface to provide large number of primary amine groups to covalently attach oligonucleotide probes, column 13, line 60 to column 14, line 21 and Figure 4, step 20), adding the sample to said reaction cell (sample solution containing target DNA is added to device, column 18, lines 25-26 and Figure 9, step 1), and providing an electrical potential to said metal electrode causing charge separation in said dielectric attachment layer (micro-electode operates in direct current mode to concentrate target DNA molecules at the micro-locations allowing rapid hybridization to the probes on the surface, column 9, lines 61-66, column 18, lines 26-35, and Figure 9, step 2), but without generating a flow of electric current or causing transfer of electrons between said layer and the sample (this is inherent property of dielectric materials such as AL_2O_3 and SiO_2, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 14, Heller teaches a method wherein said electrode is provided in contact with a surface of said layer opposite from said attachment surface (attachment surface for binding probes is formed on oxidized surfaces, which themselves are formed on metal surface below, column 13, line 60 to column 14, line 4 and Figure 2).

With regard to claims 15 and 16, Heller teaches a method wherein said electrical potential is a continuously applied potential or is applied as a series of pulses (microelectrodes operate in a direct current mode with either continuous or pulse application, column 9, lines 61-67).

With regard to claim 17, Heller teaches a method wherein said sample comprises biological substances (sample contains target DNA such as un-amplified genomic DNA, column 18, lines 26-45).

With regard to claim 18, Heller teaches a method of attracting or repelling electrically-charged entities to or from a surface of a reaction cell when performing a biological reaction (such as DNA and RNA hybridization procedures on a micro-location surface, column 16, lines 43-49, comprising the steps of providing a layer formed of a dielectric material as defining said surface (surface binding sites are provided on oxidized aluminum or SiO_2 surfaces, column 13 line 60 to column 14, line 4), and generating an electrical field by inducing charge-separation in said dielectric layer (micro-electode operates in direct current mode to concentrate target DNA molecules at the micro-locations allowing rapid hybridization to the probes on the surface, column 9, lines 61-66, column 18, lines 26-35, and Figure 9, step 2) but without generating a flow of electric current or causing transfer of electrons between said dielectric layer and the sample (this is inherent property of dielectric materials such as AL_2O_3 and SiO_2, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 19, Heller teaches a method wherein charge-separation in said dielectric layer is induced by placing an electrode in direct contact with said dielectric layer and applying a potential to said electrode (metal oxide layer is formed directly on electrode as oxidized aluminum layer, column 14, lines 1-2 and Figure 2, parts 12 and 20; metal layer such as aluminum is formed over an insulating material such as SiO_2, which is a dielectric material, column 12, lines 55-61; micro-electode operates in direct current mode to concentrate target DNA molecules at the micro-locations allowing rapid hybridization to the probes on the surface, column 9, lines 61-66, column 18, lines 26-35, and Figure 9, step 2).

With regard to claims 20 and 21, Heller teaches a method wherein a continuous potential or a pulsed potential is applied to said electrode (microelectrodes operate in a direct current mode with either continuous or pulse application, column 9, lines 61-67).

With regard to claim 22, Heller teaches a method wherein said electrode is placed in contact with a surface of the dielectric layer opposite from the surface to which the charged entities are to be attracted to or repelled from (attachment surface for binding probes is formed on oxidized surfaces, which themselves are formed on metal surface below, column 13, line 60 to column 14, line 4 and Figure 2).

With regard to claim 23, Heller teaches a method of accelerating a detection process for biological molecules performed in a reaction cell (such as a method for accelerating DNA and RNA hybridizations, column 16, lines 43-49), comprising the steps of providing a layer formed of a dielectric material defining an attachment surface of said reaction cell (surface binding sites are provided on oxidized aluminum or SiO_2 surfaces, column 13 line 60 to column 14, line 4), and generating an electrical field by inducing charge-separation in said dielectric material (micro-electode operates in direct current mode to concentrate target DNA molecules at the micro-locations allowing rapid hybridization to the probes on the surface, column 9, lines 61-66, column 18, lines 26-35, and Figure 9, step 2) but without generating a flow of electric current or causing transfer of electrons between said dielectric layer and the biological molecules or medium in which the biological molecules reside (this is inherent property of dielectric materials such as AL_2O_3 and SiO_2, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 24, Heller teaches a method wherein the molecules are nucleic acid molecules (biological molecules can be target DNA such as un-amplified genomic DNA, column 18, lines 26-45).

With regard to claim 27, Heller teaches a method wherein said electrode is in contact with a side of said dielectric layer opposite from said attachment surface (attachment surface for binding probes is formed on oxidized surfaces, which themselves are formed on metal surface below, column 13, line 60 to column 14, line 4 and Figure 2).

With regard to claims 28-31, Heller teaches a method wherein dielectric material is an oxide such as aluminum oxide and the electrode is formed of aluminum (aluminum oxide, Al_20_3, is formed over aluminum electrode, column 13 line 60 to column 14, line 4; aluminum is also formed over an insulating layer of SiO_2, column 12, lines 55-61).

With regard to claims 32-34, Heller teaches a method wherein said layer is impermeable to molecules in the sample (metal oxide layer is inherently porous as indicated by Yu below, but Heller teaches that large globular proteins such as antibodies can effectively insulate the surface and decrease the current flow, column

11, lines 29-33, though appropriate modification of the attachment layer is required to allow proper spacing of binding entities, column 11, lines 33-37).

4. Claims 13-24 and 27-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Yu et al. (U.S. Patent Pub. No. 2004/0033496).

Yu teaches a method of performing field-assisted hybridization in the detection of nucleic acid targets from a sample (see Abstract and paragraph 6, lines 1-6), comprising the steps of providing a reaction cell having a layer formed of a dielectric material defining an attachment surface (aluminum oxide layer serves as attachment site for probes, paragraph 7, lines 1-7, paragraph 38, lines 4-9, and Figure 1, and can also include a protein coating for capturing probes, paragraph 9, lines 1-7; however, the capture probes can be directly attached to the aluminum oxide layer by the addition of a terminal amine or aldehyde group, paragraph 38, lines 37-40), providing a metal electrode in direct contact with said dielectric attachment layer (aluminum oxide layer is formed by oxidation of a previously formed aluminum layer and therefore is in direct contact with aluminum layer, paragraph 8, lines 1-3 and paragraph 33, lines 1-5), attaching nucleic acid capture probes to said dielectric attachment layer (capture probes may be attached to dielectric attachment layer by antibody capture of a protein on the probe or through affinity pairs such as streptavidin and biotin, paragraph 9, lines 1-14 and Figure 1; alternatively, capture probes can be directly attached to the aluminum oxide layer by the addition of a terminal amine or aldehyde group, paragraph 38, lines 37-40), adding the sample to said reaction cell (samples applied to chip to allow hybridization to probes if target DNA is present in sample, paragraph 39, lines 1-8), and providing an electrical potential to said metal electrode causing charge separation in said dielectric attachment layer (hybridization may be accelerated by application of an electric current, paragraph 39, lines 8-9) but without generating a flow of electric current or causing transfer of electrons between said layer and the sample (this is inherent property of dielectric materials, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 14, Yu teaches a method wherein said electrode is provided in contact with a surface of said layer opposite from said attachment surface (aluminum oxide layer is formed over aluminum on one side, with attachment side for probes on the opposite side, paragraph 8, line 1 to paragraph 9, line 7, and Figure 1).

With regard to claim 15, Yu teaches a method wherein said electrical potential is a continuously applied potential (hybridization may be accelerated by application of a continuously applied electric current, paragraph 39, lines 8-9 and paragraph 43, lines 2-5).

With regard to claim 16, Yu teaches a method wherein said electrical potential is applied as a series of pulses (electric pulses may be applied to assist hybridization, paragraph 43, lines 2-6).

With regard to claim 17, Yu teaches a method wherein said sample comprises biological substances (samples may include target DNA, paragraph 39, lines 1-8 and paragraph 49, lines 1-2).

With regard to claim 18, Yu teaches a method of attracting or repelling electrically-charged entities to or from a surface of a reaction cell when performing a biological reaction (accelerating hybridization of target DNA to probes attached to surface by application of an electric current, paragraph 39, lines 1-9), comprising the steps of providing a layer formed of a dielectric material as defining said surface (aluminum oxide layer serves as attachment site for probes, paragraph 7, lines 1-7, paragraph 38, lines 4-9, paragraph 38, lines 37-40, and Figure 1), and generating an electrical field by inducing charge-separation in said dielectric layer (by applying pulses of current, paragraph 43, lines 2-10), but without generating a flow of electric current or causing transfer of electrons between said dielectric layer and the sample (this is inherent property of dielectric materials, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 19, Yu teaches a method wherein charge-separation in said dielectric layer is induced by placing an electrode in direct contact with said dielectric layer and applying a potential to said electrode (aluminum oxide layer is formed by oxidation of a previously formed aluminum layer and therefore is in direct contact with aluminum layer, paragraph 8, lines 1-3 and paragraph 33, lines 1-5; hybridization may be accelerated by application of a continuously applied electric current, paragraph 39, lines 8-9 and paragraph 43, lines 2-5).

With regard to claim 20, Yu teaches a method wherein a continuous potential is applied to said electrode (hybridization may be accelerated by application of a continuously applied electric current, paragraph 39, lines 8-9 and paragraph 43, lines 2-5).

With regard to claim 21, Yu teaches a method wherein a pulsed potential is applied to said electrode (electric pulses may be applied to assist hybridization, paragraph 43, lines 2-6).

With regard to claim 22, Yu teaches a method wherein said electrode is placed in contact with a surface of the dielectric layer opposite from the surface to which the charged entities are to be attracted to or repelled from (aluminum oxide layer is formed over aluminum on one side, with attachment side for probes on the opposite side, paragraph 8, line 1 to paragraph 9, line 7, and Figure 1).

With regard to claim 23, Yu teaches a method of accelerating a detection process for biological molecules performed in a reaction cell (accelerating hybridization of target DNA to probes attached to surface by application of an electric current, paragraph 39, lines 1-9), comprising the steps of providing a layer formed of a dielectric material defining an attachment surface of said reaction cell (aluminum oxide layer serves as attachment site for probes, paragraph 7, lines 1-7, paragraph 38, lines 4-9, paragraph 38, lines 37-40, and Figure 1), and generating an electrical field by inducing charge-separation in said dielectric material (by applying pulses of current, paragraph 43, lines 2-10) but without generating a flow of electric current or causing transfer of electrons between said dielectric layer and the biological molecules or medium in which the biological molecules reside (this is inherent property of dielectric materials, which serve as insulators and therefore do not substantially transfer electrons; see MPEP 2112-III, which states: "Where applicant claims a composition in terms of a function, property or characteristic and the composition of the prior art is the same as that of the claim but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." In re Best, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims)."

With regard to claim 24, Yu teaches a method wherein the molecules are nucleic acid molecules (samples may include target DNA, paragraph 39, lines 1-8 and paragraph 49, lines 1-2).

With regard to claim 27, Yu teaches a method wherein said electrode is in contact with a side of said dielectric layer opposite from said attachment surface (aluminum oxide layer is formed over aluminum on one side, with attachment side for probes on the opposite side, paragraph 8, line 1 to paragraph 9, line 7, and Figure 1).

With regard to claims 28-31, Yu teaches a method wherein dielectric material is an oxide such as aluminum oxide and the electrode is formed of aluminum (aluminum oxide is formed over aluminum electrode, paragraph 33, line 1 to paragraph 34, line 15).

With regard to claims 32-34, Yu teaches a method wherein said layer is impermeable to molecules in the sample (to make the layer non-porous, attachment layer contains layer of protein such as anti-DIG antibody or other protein with affinity for capture probes, since aluminum oxide layer alone is very porous and has the ability to bind many different molecules such as detection probes, paragraph 38, lines 7-37; however, the capture probes can be directly attached to the aluminum oxide layer by the addition of a terminal amine or aldehyde group, paragraph 38, lines 37-40).

Response to Arguments

5. Applicant's arguments filed July 28, 2006 have been fully considered but they are not fully persuasive.

Claims 13, 16, 18, 21, 23, 24, and 29 were previously rejected on the grounds of obviousness-type double patenting in view of claims 23 and 33 of co-pending Application No. 10/216,928. This rejection is withdrawn since these claims in the co-pending application were not elected for further prosecution.

Applicant argues that the 35 USC § 102 rejection of claims 13-24 and 27-30 under Heller et al. (U.S. Patent No. 5,605,662) should be withdrawn based on the following arguments. Applicant argues that Heller does not teach or suggest all of the elements recited in the claims as amended and thus cannot be considered to anticipate the pending claims. In particular, Applicant contends that Heller does not teach a metal layer in direct contact with a dielectric material or a dielectric attachment layer. There are at least two situations that Heller clearly teaches an electrode that forms direct contact with a dielectric material, though it is agreed that in one of these situations, the contact with the insulating substrate material of the chip, SiO_2 (column 12, lines 55-61) does not constitute direct contact with a dielectric attachment layer. However, the other situation, where a metal oxide layer is formed on a metal surface and then an attachment layer composed of APS reacts directly with the oxidized layer (column 13, lines 62-63), represents a dielectric attachment layer in direct contact with the metal electrode. Furthermore, the permeation layer that Heller teaches in this instance is the same as the attachment layer (column 13, lines 63-66), meaning the dielectric attachment layer is still in direct contact with the metal surface.

Applicant then argues that Heller teaches a method in which there is a constant flow of electric current or transfer of electrons in the circuit between the top layer and the sample to be tested. Heller does teach a free field electrophoresis to concentrate analytes at specific micro-locations, but since the dielectric attachment layer is composed of a dielectric material that inherently reduces electron flow and serves as an insulating material and attachment site for probes, as in the instant application, Heller does not teach a method wherein a flow of electric current or transfer of electrons occurs between the dielectric attachment layer and the sample. However, Applicant argues that the dielectric attachment layer of the instant application serves as a capacitor for assisting hybridization of nucleic acid in an open circuit system. While some discussion is presented in the Specification pertaining to electrically-induced hybridization, no discussion of capacitors or comparison of the attachment layer to a capacitor is made. Based on the discussion on page, line 23 to page 8, line 13 of the Specification, it appears that there would need to be a flow of electrons through the dielectric layer to the upper surface to cause a polarity shift as suggested in Figure 3, yet no explanation is provided of how such flow occurs in this type of material and what would prevent the flow to continue into the probe and sample layers. For all of these reasons, the 102 rejection of claims 13-24 and 27-31 is maintained and also extended to newly-added claims 32-34, since although the metal oxide layer taught by Heller is indeed permeable, it can be made impermeable by use of globular proteins such as antibodies as binding entities (column 11, lines 29-33).

Applicant then argues that the 103 rejection of claim 31 under Heller in view of Gerdes should be withdrawn since neither reference teaches the claimed subject matter. The 103 rejection is withdrawn, but instead, claim 31 is rejected by Heller as a 102 rejection since this reference teaches an aluminum oxide layer formed on aluminum (column 13 line 60 to column 14, line 4).

Finally, Applicant argues that currently pending claims are patentably distinct from the co-pending application 10/216,928 (U.S. Patent Pub. No. 2004/0033496). However, upon further examination, this reference teaches all the limitations of the claims, including the step of providing a metal electrode in direct contact with the dielectric material (aluminum oxide layer is formed by oxidation of a previously formed aluminum layer and therefore is in direct contact with aluminum layer, paragraph 8, lines 1-3 and paragraph 33, lines 1-5), and therefore Yu is applied as a 102(e) rejection of claims 13-24 and 27-34.

Conclusion

6. Claims 13-24 and 27-34 are rejected. No claims are allowable.

Correspondence

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David C. Thomas whose telephone number is 571-272-3320. The examiner can normally be reached on 5 days, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JEFFREY FREDMAN
PRIMARY EXAMINER
12/9/06

David C. Thomas
12/8/06
David C. Thomas
Patent Examiner
Art Unit 1637